



ATI Millersburg
1600 Old Salem Road
P.O. Box 460
Albany, OR 97321-0460
Tel: 541-926-4211
Fax: 541-967-6990
www.ATImetals.com

March 29, 2019

Mr. Ravi Sanga
EPA Remedial Project Manager
U.S. EPA Region 10
1200 Sixth Avenue, ECL 111
Seattle, WA 98101

RE: Solids Area Groundwater Remedial Action Progress Summary – Year 2018

Dear Mr. Sanga:

Please find enclosed three (3) copies of the *Solids Area Groundwater Remedial Action Progress Summary – Year 2018*. An electronic version of the report is also included.

If you have any questions, please feel free to contact me at 541.812.7376.

Sincerely,

A handwritten signature in blue ink, appearing to read "Noel Mak". The signature is fluid and cursive, with the first name "Noel" and last name "Mak" clearly distinguishable.

Noel Mak
NPL Program Coordinator

Enclosures: 1. *Solids Area Groundwater Remedial Action Progress Summary – Year 2018*



Technical Memorandum

To: Noel Mak/ATI Millersburg Operations

From: Renee Fowler/GSI Water Solutions, Inc.
Kathy Roush/GSI Water Solutions, Inc.

Date: March 29, 2019

Re: **Solids Area Groundwater Remedial Action Progress Summary – Year 2018**

This technical memorandum (TM) documents groundwater monitoring conducted for the 2018 progress summary in the Solids Area at the ATI Millersburg Operations (Oregon) (ATI) facility, formerly ATI Wah Chang (Figure 1). Groundwater monitoring data before 2018 are included as an attachment to this TM to assess historical concentration trends.

1. Background

Previous groundwater monitoring results from the Solids Area are summarized in the following documents:

- *Solids Area 2000 Groundwater Summary* (CH2M HILL, October 2000)
- *Solids Area 2001 Groundwater Summary* (CH2M HILL, January 2002)
- *Solids Area Groundwater Three-Year Review* (CH2M HILL, August 2003)
- *Solids Area 2004 Groundwater Summary* (CH2M HILL, February 2005)
- *Solids Area 2005 Groundwater Summary* (CH2M HILL, March 2006)
- *Wah Chang Solids Area Groundwater – Year 2003 to 2006 Data Summary* (CH2M HILL, May 24, 2007)
- *Solids Area Groundwater – Year 2007-2008 Remedial Action Progress Summary* (GSI Water Solutions, March 2009)
- *Solids Area Groundwater – Year 2009 Remedial Action Progress Summary* (GSI Water Solutions, February 2010)
- *Solids Area Groundwater – Year 2010 Remedial Action Progress Summary* (GSI Water Solutions, February 2011)
- *Solids Area Groundwater – Year 2011 Remedial Action Progress Summary* (GSI Water Solutions, March 2012)

- *Solids Area Groundwater – Year 2012 Remedial Action Progress Summary* (GSI Water Solutions, September 2013)
- *Solids Area, Groundwater Remedial Action Progress Summary – Year 2013* (GSI Water Solutions, October 2014)
- *Solids Area, Groundwater Remedial Action Progress Summary – Year 2014* (GSI Water Solutions, May 2015)
- *Sitewide Groundwater and Surface Water Sampling Results – 2016* (GSI Water Solutions, March 2017)
- *Millersburg Operations Solids Area Groundwater Data Summary – 2017* (GSI Water Solutions, March 2018)

These documents provide detailed site information, which is not repeated in this TM. This TM discusses groundwater data collected in the Solids Area for the 2018 monitoring event.

2. Solids Area

The Solids Area was used for storage of waste material from facility operations, including lime solids, magnesium chloride, and sand chlorination process waste. Waste material was removed and/or excavated from the Solids Area by the early 1990s. A remedial investigation/feasibility study (RI/FS) (CH2M HILL, 1993) for the ATI facility indicated that groundwater in the Solids Area was affected by chlorinated volatile organic compounds (CVOCs), metals, anions/cations, and radionuclides. Following completion of the RI/FS, the U.S. Environmental Protection Agency (EPA) issued a Record of Decision (ROD) for the ATI facility that specified 3 years of groundwater monitoring (EPA, 1994). ROD-required groundwater monitoring was completed in 2002. At that time, the cleanup standards had been met for CVOCs and trace metals (CH2M HILL, 2003). Testing for radionuclides via thorium isotopes also had met the cleanup standards (CH2M HILL, 2003). ATI notified EPA in 2003 that groundwater monitoring would continue with a reduced list of constituents. In 2013, chloride and manganese were removed from the list of constituents, as neither compound drives risk in the Solids Area nor serves as an indicator for other constituents, as discussed in the Year 2012 Summary.

In September 2010, ATI made a facility improvement in the Solids Area. The eastern “pond,” formerly known as Schmidt Lake and now named Cell 3, was excavated and lined with high-density polyethylene material as part of a joint project with the Cities of Albany and Millersburg to divert ATI’s wastewater discharge from Truax Creek to the City of Albany’s new wetland treatment system. Water is pumped from Pond 2 to Cell 3 for additional cooling and then discharged to the wetland treatment system. The Cell 3 area was unused before being lined and surface water levels were an expression of groundwater, recent precipitation events, or went dry during the summer season. The Solids Area is not monitored for National Pollutant Discharge Elimination System or Publicly Owned Treatment Works permits.

3. Groundwater Monitoring

The site includes five hydrostratigraphic units (i.e., Recent Alluvium, Willamette Silt, Linn Gravel, Blue Clay, and Spencer Formation). Seventeen monitoring wells have been installed in the Solids Area and are completed in three of the hydrostratigraphic units, as shown in Table 1.

The type of monitoring at each well, including water levels and analytical groundwater samples, is listed in Table 1 for the 2018 monitoring event. Monitoring well locations are shown in Figure 1 and well construction details are in Attachment A.

Groundwater Elevations

Table 2 presents groundwater level measurements and calculated groundwater elevations recorded in 2018. Groundwater measurements in 2018 were synoptic and were used for groundwater elevation contouring. Figure 2 shows the Solids Area groundwater elevation contours of the wells screened in the Willamette Silt.

The surface elevation in Cell 3 is designed to range between 197.0 and 202.5 feet above mean sea level. Because Cell 3 is lined, it is not expected to affect groundwater elevations. There have been no significant changes observed in groundwater elevations in monitoring wells located adjacent to Cell 3, relative to monitoring wells located more distant from Cell 3, since the liner was completed in September 2010.

Groundwater Parameters

Field parameters were recorded after parameter stabilization and before collecting analytical groundwater samples at each monitoring well. A YSI 556 multiparameter instrument connected to a closed flow-through cell was used to measure field parameters during purging of the wells. The instrument was calibrated daily using fresh calibration standards recommended by the instrument manufacturer. Table 3 presents the stable field measurements recorded before collecting groundwater samples in the monitoring wells.

Quality Control Program

Groundwater monitoring in 2018 was completed in conformance with the quality assurance project plan (QAPP; GSI, 2015). All samples were immediately placed in iced coolers and maintained under chain-of-custody protocols. ATI or GSI Water Solutions, Inc. (GSI), personnel delivered samples to the laboratory (Apex Laboratory in Tigard, Oregon) during collection periods.

Duplicate samples for field quality control (QC) were collected at a frequency of 5 percent of the samples collected during the event. All duplicate samples were collected at the same time as the parent sample, and were blind-labeled and delivered to Apex with the normal shipment. Matrix spike and matrix spike duplicate samples also were collected at a frequency of 5 percent and when potential changes in the sample matrix were anticipated because of previous sampling results. Apex provided the use of approved analytical methods according to the QAPP, analytical data package deliverables, and conformance with the laboratory's quality assurance (QA) manual.

Field and laboratory data were subjected to a formal verification and validation process in accordance with EPA guidance documents, as described in the QAPP. An external party, as defined in EPA's *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (EPA, 2009), QA/QC Solutions, LLC, performed the data validation to determine

the usability of the data for meeting project objectives. An abbreviated validation review (i.e., a summary review of the results reported) was performed on 90 percent of the data and a more comprehensive validation review was performed on 10 percent of the data, as described in Section D.1 of the QAPP.

Data qualifiers were assigned during data validation to the electronic data deliverables (EDDs) when applicable QA and QC limits were not met and the qualification was warranted following guidance specified by EPA (EPA, 2002, 2008, and 2010), QC requirements specified in the QAPP, and method-specific QC requirements, as applicable. Final, qualified (as necessary) laboratory results were transmitted in EDDs for data management, further evaluation, and reporting.

After verification and validation of the field and laboratory data, as described above, data completeness was calculated by comparing the total number of acceptable data (non-rejected data) to the total number of data points generated. Overall, completeness for the 2018 sampling events was 100 percent (i.e., no data were rejected).

Groundwater Analytical Sampling

Groundwater samples were analyzed for radium-226/228, chloride, fluoride, and nitrate at monitoring wells that had high radium, fluoride, or nitrate detections in the past (see Table 1). Samples were analyzed for:

- Chloride, fluoride, and nitrate by EPA 300 series methods
- Radium-226/228 by EPA 903.1/904.0 methods

Starting in 2011, the analytical method for radium-226/228 was changed to obtain a lower method detection limit of 2.5 picocuries per liter (pCi/L) to provide for a more accurate comparison with the cleanup standard of 5 pCi/L, as requested by EPA.

Table 4 presents laboratory analytical results for groundwater sampled, with no detections above the applicable cleanup standards, in the 2018 annual sampling event. Attachment B presents historical groundwater analytical results collected in the Solids Area from 2009 to 2018.

In 2016, a sitewide sampling event was conducted with additional constituents analyzed that are not routine for the annual groundwater monitoring event (GSI, 2018). Some wells had cleanup standard exceedances for constituents not included in the annual groundwater monitoring. These constituents were resampled in 2018 for verification and evaluation purposes. Table 5 presents the 2016 sitewide results and the 2018 resample results. With the exception of cyanide in well PWF-2 and radium 226 in well PWB-3, the 2018 resample results for dissolved and total arsenic, cyanide, and radium-226/228 were similar to what was observed in 2016 and remained above the cleanup standard. ATI will use these data to determine what modifications are needed to the monitoring program and the revisions will be proposed to EPA in the Sitewide Exceedance Analysis report, to be submitted in May 2019.

4. Conclusions

Based on the groundwater monitoring results from the 2018 monitoring event in the Solids Area, the following observations were made:

- Analytical results for chloride, nitrate, and radium-226/228 as part of the routine monitoring program were either not detected or detected below the cleanup standards in all wells.
- 2018 was the first year that fluoride was either not detected or was detected below the cleanup standard in all monitoring wells. The highest detected concentration was 2.08 milligram per liter (mg/L) at PWB-3, nearly half of the cleanup standard (4 mg/L).
- Nitrate analytical results have been either not detected or detected below the cleanup standard in all wells since 2003.
- Radium-226/228 analytical results have been not detected or detected below the cleanup standards at PW-07 since 2008. At that time, combined radium was not detected, but the reporting limit for the analysis was above the cleanup standard.

5. Summary

The results of annual monitoring in the Solids Area through 2018 have been non-detect or detected below the cleanup standards since 2008, with the exception of fluoride, which was not detected above the cleanup standard in 2018. ATI will continue to monitor the Solids Area in accordance with Section 10.1.1.3 of the ROD.

6. References

- CH2M HILL. 1993. Remedial Investigation/Feasibility Study Report for the Soil, Groundwater and Sediments Operable Unit. Prepared by CH2M HILL. 1993.
- CH2M HILL. 2003. Solids Area Groundwater Three-Year Review. Prepared by CH2M HILL. August 2003.
- EPA. 1994. Record of Decision for the Groundwater and Sediments Operable Unit for ATI Wah Chang Albany. U.S. Environmental Protection Agency. June 1994.
- EPA. 2002. Guidance on Environmental Data Verification and Validation. EPA QA/G-8. EPA/240/R-02/004. November 2002.
- EPA. 2008. USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review. EPA-540/R-08/01. June 2008.
- EPA. 2009. Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use. EPA 540-R-08-005. U.S. Environmental Protection Agency (EPA). January 2009.
- EPA. 2010. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review. EPA-540/R-10/011. January 2010.

GSI. 2015. Quality Assurance Project Plan for Site-Wide Remedial Actions. Prepared by GSI Water Solutions, Inc. December 2015.

GSI. 2018. Sitewide Groundwater and Surface Water Sampling Results – 2016, Revised. Prepared by GSI Water Solutions, Inc. March 2018.

Table 1. Solids Area Monitoring Activities in 2018*ATI Millersburg Operations, Oregon*

Well	Hydrostratigraphic Unit	Groundwater Elevation	Chloride	Fluoride	Nitrate	Radium 226/228
PW-07	Recent Alluvium	X	X	X	X	X
PW-09	Recent Alluvium	X	X	X		
PW-17B	Recent Alluvium	X	X	X		
PW-18B	Recent Alluvium	X	X	X		
PWA-1	Recent Alluvium	X	X			
PWA-2	Linn Gravel	X	X			
PWB-1	Recent Alluvium	X	X	X		
PWB-2	Linn Gravel	X	X	X		
PWB-3	Spencer Formation	X	X	X		
PWC-1	Recent Alluvium	X	X			
PWC-2	Spencer Formation	X	X			
PWD-1	Linn Gravel	X	X			
PWD-2	Spencer Formation	X	X			
PWE-1	Linn Gravel	X	X	X		
PWE-2	Spencer Formation	X	X	X		
PWF-1	Recent Alluvium	X	X		X	
PWF-2	Spencer Formation	X	X		X	

Notes:

PW designation indicates monitoring well.

Table 2. Solids Area Wells Groundwater Elevation in 2018
ATI Millersburg Operations, Oregon

Well	TOC Elev (ft amsl)	DTW (ft bgs)	GW Elev (ft amsl)
PW-07	205.8	14.15	191.65
PW-09	200.13	22.50	177.63
PW-17B	184.14	11.13	173.01
PW-18B	188.24	20.92	167.32
PWA-1	192.82	16.49	176.33
PWA-2	193.04	16.03	177.01
PWB-1	182.9	5.45	177.45
PWB-2	182.94	5.84	177.10
PWB-3	182.86	5.90	176.96
PWC-1	202.69	18.95	183.74
PWC-2	202.65	19.04	183.61
PWD-1	192.51	22.92	169.59
PWD-2	192.49	19.71	172.78
PWE-1	190.5	12.83	177.67
PWE-2	190.53	13.28	177.25
PWF-1	204.76	21.80	182.96
PWF-2	204.68	21.72	182.96

Notes:

DTW = depth to water

ft amsl = feet above mean sea level

ft bgs = feet below ground surface

GW Elev = groundwater elevation

TOC = top of casing

Table 3. Solids Area Groundwater Field Parameters in 2018*ATI Millersburg Operations, Oregon*

Well	Temperature (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH (unit)	Oxidation-Reduction Potential (mV)
<i>Cleanup Standard</i>	--	--	--	6.5 - 8.5 ¹	--
PW-07	18.21	404	0.26	6.82	79.8
PW-09	NS	NS	NS	NS	NS
PW-17B	13.82	1,719	0.25	6.44	27.6
PW-18B	11.4	170	0.58	5.20	81.2
PWA-1	14.5	3,130	0.69	7.17	-21.9
PWA-2	14.2	4,407	0.60	6.72	69.9
PWB-1	15.1	1,275	0.77	6.76	-66.2
PWB-2	15.2	1,295	0.90	6.85	-89.1
PWB-3	15.6	10,080	0.73	6.34	46.1
PWC-1	16.6	819	1.03	6.64	-3.1
PWC-2	16.8	865	1.13	6.66	-9.1
PWD-1	13.35	3,622	0.20	6.57	17.7
PWD-2	15.3	4,198	0.30	6.87	36.5
PWE-1	13.2	812	0.59	6.39	40.9
PWE-2	13.25	1,669	0.54	6.19	19.5
PWF-1	16.83	2,905	0.39	6.87	41.5
PWF-2	15.73	3,354	0.18	6.87	48.9

Notes:

¹ The cleanup standard is the U.S. Environmental Protection Agency drinking water secondary maximum contaminant level (SMCL).

°C = degree Celsius

µS/cm = micro Siemen per centimeter

mg/L = milligram per liter

mV = millivolt

NS = not sampled due to insufficient volume

Table 4. Solids Area Analytical Results in 2018*ATI Millersburg Operations, Oregon*

Well	Chloride (mg/L)	Fluoride (mg/L)	Nitrate (mg/L)	Radium-226 (pCi/L)	Radium-228 (pCi/L)
<i>Cleanup Standard</i>	<i>none</i>	<i>4</i>	<i>10</i>	<i>5 (combined)</i>	
PW-07	48	1 U	0.25 U	0.32	-0.21
PW-09	NS	NS	--	--	--
PW-17B	466	1.30	--	--	--
PW-18B	12.3	1.89	--	--	--
PWA-1	960	--	--	--	--
PWA-2	1,520	--	--	--	--
PWB-1	163	1.11	--	--	--
PWB-2	167	1.15	--	--	--
PWB-3	4,070	2.08	--	--	--
PWC-1	10.9	--	--	--	--
PWC-2	13.0	--	--	--	--
PWD-1	1,160	--	--	--	--
PWD-2	1,370	--	--	--	--
PWE-1	151	2.06	--	--	--
PWE-2	463	1.00 U	--	--	--
PWF-1	792	--	0.25 U	--	--
PWF-2	810	--	0.25 U	--	--

NOTES:

-- = not a part of the sampling program

mg/L = milligrams per liter

NS = not sampled due to insufficient volume

pCi/L = picocuries per liter

U = analyte not detected above method reporting limit

Table 5. Solids Area Sitewide Exceedance Resampling*ATI Millersburg Operations, Oregon*

Well	Analyte	Cleanup Level	Units	2016 Sitewide Result	Resample Date	2018 Resample Result
PWB-1	Arsenic, Dissolved	10	µg/L	10.1	8/22/2018	11.8
	Arsenic, Total	10	µg/L	10.1	8/22/2018	11.3
PWB-2	Arsenic, Dissolved	10	µg/L	14.5	8/22/2018	14.6
	Arsenic, Total	10	µg/L	14.2	8/22/2018	16.1
PWB-3	Radium-226	5	pCi/L	1.5	8/22/2018	11
	Radium-228		pCi/L	5.5	8/22/2018	3.3
PWE-1	Arsenic, Dissolved	10	µg/L	11.1	8/22/2018	10.5
	Arsenic, Total	10	µg/L	10.3	8/22/2018	10.9
PWF-1	Cyanide	200	µg/L	275	8/24/2018	224
PWF-2	Cyanide	200	µg/L	323	8/24/2018	95.7

Notes:

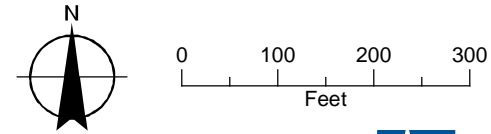
µg/L = microgram per liter

pCi/L = picocuries per liter



FIGURE 1
Solids Area Monitoring Wells
ATI Millersburg Operations, Oregon

- LEGEND**
- **PWB-1** Monitoring Well Screened in Recent Alluvium or Willamette Silt
 - **PWB-2** Monitoring Well Screened in Linn Gravel
 - **PWB-3** Monitoring Well Screened in Blue Clay or Spencer Formation
 - Cell 3 Boundary
 - Property Boundary
 - Railroad



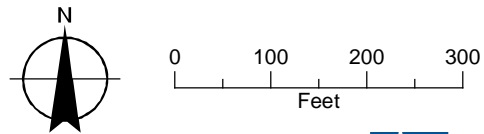
Date: March 26, 2018
Data Sources: City of Albany GIS, ATI,
NAIP 2016



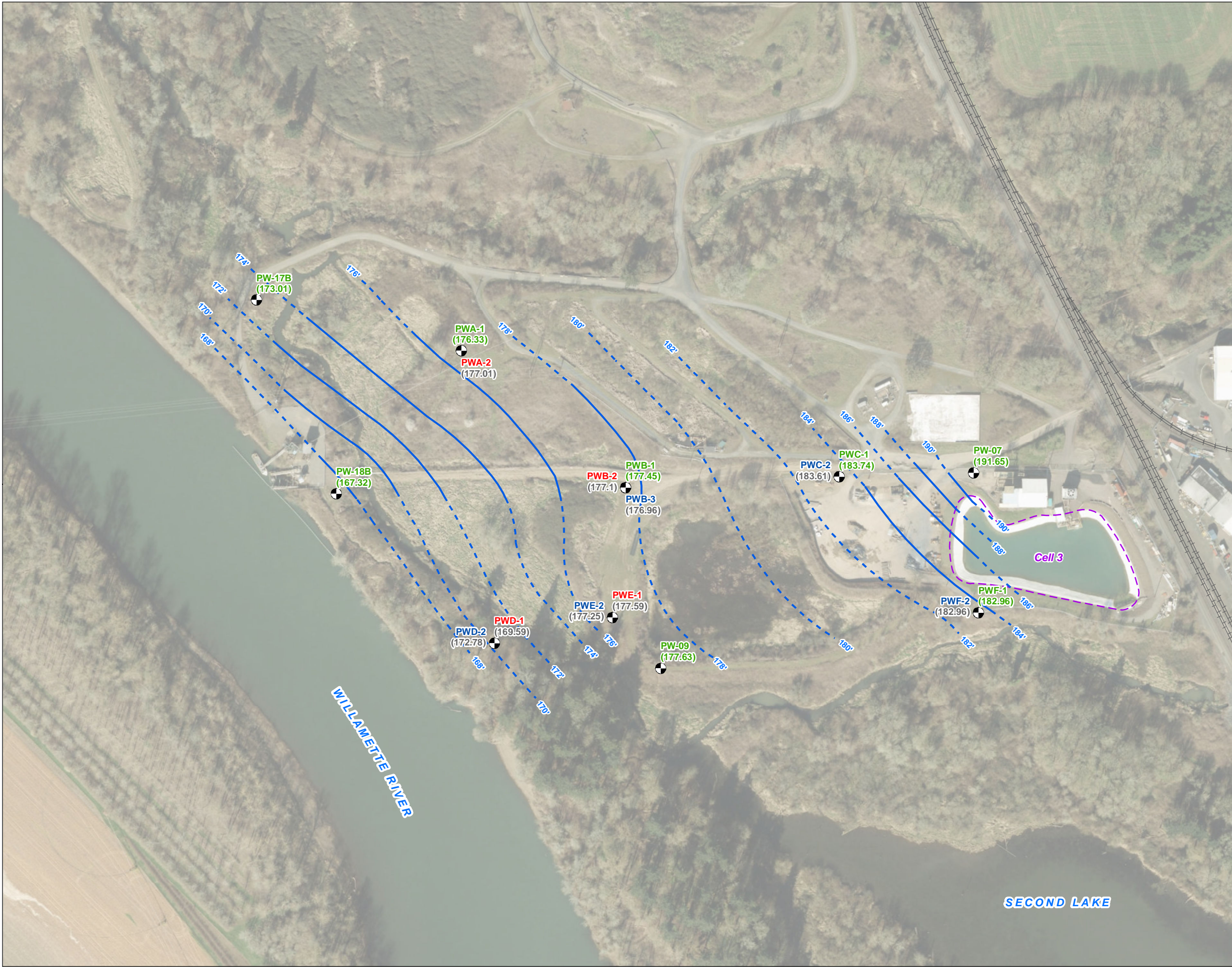
FIGURE 2
Solids Area
Groundwater Contours
2018 Annual Monitoring Event
ATI Millersburg Operations, Oregon

- LEGEND**
- PWB-1** Monitoring Well Screened in Recent Alluvium or Willamette Silt
 - PWB-2** Monitoring Well Screened in Linn Gravel
 - PWB-3** Monitoring Well Screened in Blue Clay or Spencer Formation
 - Groundwater Contour (dashed where inferred)
 - Cell 3 Boundary
 - Railroad

- NOTES:**
- Recent Alluvium or Willamette Silt used for contouring.
 - Elevations in gray (Linn Gravel, Blue Clay, Spencer Formation) are not included in water level contouring.
 - Cell 3 lined in September 2010. Operational levels are from 197' to 202.5'.



Date: March 26, 2019
Data Sources: City of Albany GIS, ATI,
NAIP 2016



Attachment A
Well Construction Details

Table A-1. Solids Area Well Construction Details*ATI Millersburg Operations, Oregon*

Station	Well Construction Data					Screen Depth		Screen Elevations		Regulatory Identification	Location Data	
Well	Borehole Diameter (inches)	Well Diameter (inches)	TOC Elevations (ft msl)	Stick Up (ft ags)	Bottom of Well Casing (ft bgs)	Top (ft bgs)	Bottom (ft bgs)	Top (ft msl)	Bottom (ft msl)	Date Constructed	Easting	Northing
PW-07	10	6	205.80	0.70	25	21	22	184.80	183.80	12/6/1978	7533432.40	373282.82
PW-09	6	4	200.13	-0.47	20.7	--	--	200.13	200.13	5/19/1981	7532784.00	372877.57
PW-17B	8	4	184.14	2.64	23.5	11.5	21.5	172.64	162.64	3/22/1989	7531945.95	373641.05
PW-18B	8	4	188.24	2.34	26.3	14.3	24.3	173.94	163.94	3/20/1989	7532111.29	373239.05
PWA-1	10	2	192.82	1.12	25	19	24	173.82	168.82	8/4/1982	7532370.65	373535.69
PWA-2	10	2	193.04	1.34	38	31	38	162.04	155.04	8/4/1982	7532370.65	373535.69
PWB-1	10	2	182.90	2.1	13	9.2	13	173.70	169.90	8/2/1982	7532711.06	373252.02
PWB-2	10	2	182.94	2.14	42	25	37	157.94	145.94	8/2/1982	7532711.06	373252.02
PWB-3	10	2	182.86	2.06	68	58	68	124.86	114.86	8/2/1982	7532711.06	373252.02
PWC-1	10	2	202.69	1.39	29	16	26	186.69	176.69	8/3/1982	7533153.59	373274.71
PWC-2	10	2	202.65	1.35	65	50	60	152.65	142.65	8/3/1982	7533153.59	373274.71
PWD-1	10	2	192.51	1.91	37	31	37	161.51	155.51	7/30/1982	7532438.73	372929.44
PWD-2	10	2	192.49	1.89	72	60	70	132.49	122.49	7/30/1982	7532438.73	372929.44
PWE-1	10	2	190.50	2.10	24	12	22	178.50	168.50	7/30/1982	7532683.50	372982.93
PWE-2	10	2	190.53	2.13	46.5	32.5	42.5	158.03	148.03	7/30/1982	7532683.50	372982.93
PWF-1	10	2	204.76	0.96	22	17	22	187.76	182.76	8/3/1982	7533442.12	372992.66
PWF-2	10	2	204.68	0.88	54	39	49	165.68	155.68	8/3/1982	7533442.12	372992.66

Notes:

-- = not available

ft ags = feet above ground surface

ft bgs = feet below ground surface

ft msl = feet above mean sea level

TOC = top of casing

Attachment B
Groundwater Quality Data

Table B-1. Solids Area Groundwater Quality Data in 2009-2018*ATI Millersburg Operations, Oregon*

Well	Analyte	Units	Cleanup Standard	September 2009	September 2010	September 2011	September 2012	August 2013	January 2015 ⁴	June 2016	August 2017	August 2018
PW-07	Fluoride	mg/L	4	1 U	1 U	1 U	1 U	1 U	0.163 J	0.173 J	0.12	1 U
PW-09	Fluoride	mg/L	4	2	1 U	1 U	1 U	1 U		1.69	1.87	
PW-17B	Fluoride	mg/L	4	1 U	1 U	1 U	1 U	1 U	0.472 J	1.06	0.62	1.3
PW-18B	Fluoride	mg/L	4	2	2	1.8	1.4	1.36	0.458 J	1.96	1.89	1.89
PWA-1	Fluoride	mg/L	4							0.22 J		
PWA-2	Fluoride	mg/L	4							1 U		
PWB-1	Fluoride	mg/L	4	2	2	2	2	1.89	1.33	1.36	1.08	1.11
PWB-2	Fluoride	mg/L	4	2	1 U	1 U	1 U	1 U	1.22	1.48	1.8	1.15
PWB-3	Fluoride	mg/L	4	2	2	1.7	1.5	1.48	1.79	10.4	5.15	2.08
PWC-1	Fluoride	mg/L	4							0.34 J		
PWC-2	Fluoride	mg/L	4							0.29 J		
PWD-1	Fluoride	mg/L	4							0.063 J		
PWD-2	Fluoride	mg/L	4							0.135 J		
PWE-1	Fluoride	mg/L	4	3.9	2.7	2.1	2	1.93		2.67	2.67	2.06
PWE-2	Fluoride	mg/L	4	1 U	1 U	1 U	1 U	1 U		0.053 J	0.017	1 U
PWF-1	Fluoride	mg/L	4							0.274 J		
PWF-2	Fluoride	mg/L	4							0.122 J		
PW-07	Manganese	mg/L	none ^{1,2}	0.6	0.55	0.53	0.49			0.545		
PW-09	Manganese	mg/L	none ^{1,2}	5.1	4.9	4.7	3.6			2.42		
PW-17B	Manganese	mg/L	none ^{1,2}	7.6	7.2	6.8	6.2			8.27		
PW-18B	Manganese	mg/L	none ^{1,2}	0.23	0.19	0.17	0.15			0.0195		
PWA-1	Manganese	mg/L	none ^{1,2}	7.9	8.1	7.7	7.7			6.31		
PWA-2	Manganese	mg/L	none ^{1,2}	13	12.1	12	11.1			8.12		
PWB-1	Manganese	mg/L	none ^{1,2}	0.8	0.7	0.6	0.61			2.31		
PWB-2	Manganese	mg/L	none ^{1,2}	0.84	0.77	0.73	0.69			2.32		
PWB-3	Manganese	mg/L	none ^{1,2}	13	12	10	9.1			20.2		

Table B-1. Solids Area Groundwater Quality Data in 2009-2018*ATI Millersburg Operations, Oregon*

Well	Analyte	Units	Cleanup Standard	September 2009	September 2010	September 2011	September 2012	August 2013	January 2015 ⁴	June 2016	August 2017	August 2018
PWC-1	Manganese	mg/L	none ^{1,2}	0.98	0.87	0.79	0.73			1.34		
PWC-2	Manganese	mg/L	none ^{1,2}	0.97	0.89	0.86	0.84			0.937		
PWD-1	Manganese	mg/L	none ^{1,2}	8.3	8.1	7.5	7.2			6.33		
PWD-2	Manganese	mg/L	none ^{1,2}	1.2	1	0.98	0.66			1.87		
PWE-1	Manganese	mg/L	none ^{1,2}	1.1	0.99	0.85	0.72			2.21		
PWE-2	Manganese	mg/L	none ^{1,2}	5.1	4.9	4.6	4.3			11.8		
PWF-1	Manganese	mg/L	none ^{1,2}	2.3	1.8	1.8	1.6			2.33		
PWF-2	Manganese	mg/L	none ^{1,2}	2.7	2.4	2.3	2			2.73		
PW-07	Nitrate	mg/L	10	5 U	5 U	5 U	5 U	5 U	9.14	2.58	1.84	0.354
PW-09	Nitrate	mg/L	10							0.094 U		
PW-17B	Nitrate	mg/L	10							0.0948 J		
PW-18B	Nitrate	mg/L	10							0.18		
PWA-1	Nitrate	mg/L	10							0.099 J		
PWA-2	Nitrate	mg/L	10							0.097 J		
PWB-1	Nitrate	mg/L	10							0.18		
PWB-2	Nitrate	mg/L	10							0.1		
PWB-3	Nitrate	mg/L	10							0.1 U		
PWC-1	Nitrate	mg/L	10							0.14		
PWC-2	Nitrate	mg/L	10							0.1 U		
PWD-1	Nitrate	mg/L	10							0.09 U		
PWD-2	Nitrate	mg/L	10							0.115 U		
PWE-1	Nitrate	mg/L	10							0.1 U		
PWE-2	Nitrate	mg/L	10							0.1 U		
PWF-1	Nitrate	mg/L	10	5 U	5 U	5 U	5 U	5 U	1.38	2.31	1.46	1.14
PWF-2	Nitrate	mg/L	10	5 U	5 U	5 U	5 U	5 U	0.016	0.1 U	0.1 U	0.25 U
PW-07	Radium-226	pCi/L	5 ³	40 U	5 U	2.5 U	2.5 U	2.5 U	1	0.21	0.18	0.32

Table B-1. Solids Area Groundwater Quality Data in 2009-2018

ATI Millersburg Operations, Oregon

Well	Analyte	Units	Cleanup Standard	September 2009	September 2010	September 2011	September 2012	August 2013	January 2015 ⁴	June 2016	August 2017	August 2018
PW-07	Radium-228	pCi/L	5 ³	40 U	5 U	2.5 U	2.5 U	2.5 U	0.35	0.69	-0.11	-0.21
PW-07	Chloride	mg/L	none ²	27	25	24	21			28.3	27.8	48
PW-09	Chloride	mg/L	none ²	670	590	575	555			71.9	71.8	
PW-17B	Chloride	mg/L	none ²	820	808	785	716			526	405	466
PW-18B	Chloride	mg/L	none ²	45	50	45	41			15	15.2	12.3
PWA-1	Chloride	mg/L	none ²	1.6	1.4	1.2	1.1			1,060	1,120	960
PWA-2	Chloride	mg/L	none ²	3	2	1.6	1.7			1,790	1,800	1,520
PWB-1	Chloride	mg/L	none ²	53	48	42	32			60.8	648	163
PWB-2	Chloride	mg/L	none ²	51	47	43	19			60.6	1,610	167
PWB-3	Chloride	mg/L	none ²	4.7	4.1	3.8	3.3			1,030	3,620	4,070
PWC-1	Chloride	mg/L	none ²	10	9	7.6	7.2			13.2	16	10.9
PWC-2	Chloride	mg/L	none ²	13	11	10	9			12.4	18.5	13
PWD-1	Chloride	mg/L	none ²	1,780	1,580	1,430	1,260			1,460	1,220	1,160
PWD-2	Chloride	mg/L	none ²	592	575	525	510			1,330	1,290	1,370
PWE-1	Chloride	mg/L	none ²	95	94	92	88			134	163	151
PWE-2	Chloride	mg/L	none ²	1,520	1,460	1,380	1,160			1,200	660	463
PWF-1	Chloride	mg/L	none ²	1.1	1.2	1.1	1.1			659	784	792
PWF-2	Chloride	mg/L	none ²	1.4	1.1	1.1	1.1			1,280	1,300	810

Notes:

¹ Standard modified in 2010 to reflect Oregon Environmental Quality Commission's removal of risk-based manganese freshwater criteria.

² In 2013, manganese and chloride were removed from the analyte list.

³ Radium exceeds cleanup level if total of radium-226 and radium-228 exceeds 5 pCi/L.

⁴ Monitoring event for 2014 was conducted in January 2015.

J = estimated value below method reporting limit

pCi/L = picocuries per liter

mg/L = milligrams per liter

U = analyte not detected above method reporting limit

10-year rolling table. Refer to past annual reports for a full record of historical concentrations.

Blank cells indicate no analysis performed.

Bold indicates that concentration meets or exceeds the cleanup standard. Refer to Quality Assurance Project Plan for Sitewide Remedial Action Table B-4 for details (GSI, 2015).